

Wireless Radio Test Sets

IFR 2975 Project 25 Radio Test Set



AEROFLEX
A passion for performance.

A test solution designed from the ground up to handle today's advanced digital radio applications

New, Expanded Service Monitor Functions

- 2.7 GHz Frequency Range with 2.7 GHz Spectrum Analyzer and Tracking Generator
- New "Try before you buy" options
- 500 kHz (Useable) Dual-Channel Oscilloscope
- 12.5, 25, 60 and 200 kHz IF Filters
- User Selectable Audio Filters
- Tone Signaling/Tone Remote Functions
- New Auto-tune Capabilities
- New Zero Span Spectrum Analyzer Mode
- New LTR Trunking Option
- New 40 kHz Audio Analyzer

New and Exclusive P25 Test Features

- New P25 Trunking Emulation
- New Exclusive P25 Inbound Signaling Packet (ISP) Decode Function
- New Exclusive P25 Outbound Signaling Packet (OSP) Message Programmer
- Full TIA/EIA-102 Test Patterns
- AES and DES OFB Type III Encryption
- CQPSK Transmit and Receive
- CQPSK EVM and Constellation Display

Exclusive SmartNet™/SmartZone™ Tests

- Control Channel Assignment to P25 or SmartNet™/SmartZone™ Traffic Channel
- SmartNet™/SmartZone™ Scanner
- SmartNet™/SmartZone™ Test Functions

Innovative Control and Operational Features

- Quick Tune Spectrum Analyzer
- PS-2 Keyboard and Mouse Operation
- IP Addressable
- RS-232, GPIB and Ethernet Operation

The NEW Standard for P25 Testing

Since 1976, Aeroflex has provided cutting-edge test solutions to the mobile radio industry. Aeroflex carries on that tradition with the 2975 Radio Test Set. It's a test solution designed from the ground up to handle today's advanced communication applications.

- Project 25 parametric, protocol and Common Air Interface testing
- IMBE vocoder and data encryption tests
- Modulation and demodulation of C4FM and CQPSK
- AES and DES OFB Type III encryption/decryption support
- Exclusive standard C4FM Modulation Fidelity meter and CQPSK EVM option allows for true transmitter alignment

"Try before you buy" for IFR 2975 Test Set Options

The IFR 2975 offers unique "try before you buy" options where customers can try an option before purchase. Owners of 2975 test sets can try 2975 options for up to 30 days before making an investment

For the very latest specifications visit www.aeroflex.com

decision. Once the choice is made, the options can be enabled in the field. Options for the 2975 radio test set include:

- **Advanced Encryption Systems (AES) Option:** Includes support for higher security features as well as continued support for the current Digital Encryption System (DES) Type III used in existing P25 systems.
- **Encryption Key Management Option:** Provides the ability to fully manage keys via the KVL-3000+™ using the P25 key management protocol including the ability to load individual, multiple and groups of keys. The 2975 also supports programming of keys through the front panel for manual key management.
- **Linear Simulcast Modulation™ Option:** With both transmitter and receiver tests, the 2975 now supports parametric measurements for repeater tests utilizing CQPSK modulation for LSM applications.
- **P25 Phase II CQPSK Option:** This enables all the functionality of the 2975 for use in 6.25 kHz bandwidths.
- **VHF/UHF P25 Trunking Option:** Provides capability for new system development utilizing P25 technology in existing VHF/UHF band for public mobile radio applications.
- **Control Channel Logging Option:** This exclusive feature for P25 trunked operations allows users to verify conformance with various P25 radio systems offered by a number of different manufacturers.
- **P25 Trunking Protocol Option:** With the ability to optionally set P25 OSP messages for control channel and decode ISP messages from user radios, the 2975 verifies protocol operation of radios on P25 networks.
- **900 MHz Band Option:** Support for SmartNet™/SmartZone™ systems used in commercial business applications.
- **NEW LTR™ Trunking Option:** Support for both repeater simulator and mobile simulation.
- **NEW 0 - 40 kHz Audio Analyzer Option:** Support for extended audio analysis.
- **NEW Analog Simulcast Option:** Allows for fast alignment of analog simulcast systems.
- **NEW BER Tests Option:** Allows for TX BER as well as RX BER measurements using a defined serial connection.
- **NEW AutoTest application Option:** Speeds testing and logging of test results on analog and P25 conventional radio systems.

NEW P25 Trunking Test Gives Flexibility to P25 Radio Testing

With the Optional P25 Trunking application, the 2975 now provides test professionals the ability to quickly and dynamically test P25 mobile subscriber units operating in the VHF/UHF, 700 MHz and 800 MHz bands. The 2975 provides the required P25 control channel with user defined parameters for Unit/Group call procedures including the exclusive ability to set downlink OSP control channel message elements and to decode the uplink ISP messages for use in verification of mobile interoperability. With P25 Trunking (Options 4 and 14), the user can initiate tests without the need to go through a predetermined test sequence. These tests include transmitter verification of performance and receiver sensitivity tests that are separate, easy tests. With the 2975's exclusive "meter panel", test times for subscriber units can be reduced to less than 30 seconds!

New TIA/EIA-102 Test Patterns

The 2975 now supports exclusive test patterns per TIA/EIA-102CAA standards. These patterns include:

STD 1011 - Standard Tone Test Pattern which produces a 1011 Hz tone at the reference level at the receiver vocoder.

STD CAL - Calibration Test Pattern which provides a modified version of the 1011 Hz tone by inverting every 20th bit, yielding 172 errors out of 3456 bits (4.977% BER).

STD SILENCE - Standard Silence Test Pattern which produces audio silence (no sound) at the receiver vocoder output.

STD INTFRNC - Standard Interference Test Pattern which produces audio silence (no sound) at the receiver vocoder output and is balanced to have approximately equal positive and negative signal deviations.

STD BUSY - Standard Busy Test Pattern which produces channel busy information.

STD IDLE - Standard Idle Test Pattern which produces channel idle information.

STD LDU1TRG - Trigger On Start Of Link Data Unit 1 (LDU1) which produces a trigger at the start of Link Data Unit 1 (LDU1).

STD NOTRIG - No Trigger which produces no trigger.

STD LDU2TRG - Trigger On Start Of Link Data Unit 2 (LDU2) which produces a trigger at the start of Link Data Unit 2 (LDU2).

STD 511 (V52) - Standard Transmitter Test Pattern which produces a standard transmitter test pattern by continuously repeating a 511 bit binary pseudorandom bit sequence based upon ITU-T O-153, formerly CCITT V52.

STD SYMRATE - Standard Transmitter Symbol Rate Pattern which produces a standard transmitter symbol rate pattern by continuously repeating a bit stream defined as the following pattern:

01 01 11 11 01 01 11 11 ...

STD LOWDEV - Standard Transmitter Low Deviation Pattern which produces a standard transmitter low deviation pattern by continuously repeating a bit stream defined as the following pattern:

10 10 00 00 10 10 00 00 ...

STD FIDPAT - Standard Transmitter C4FM Modulation Fidelity Pattern which produces a standard transmitter C4FM modulation fidelity pattern by continuously repeating a bit stream defined as the following 24-bit pattern: 01 01 11 00 00 01 10 01 11 10 11 11 ...

STD FIDSPECT - Standard Transmitter C4FM Modulation Fidelity Spectrum.

NEW SmartNet™/SmartZone™ Test Functions Provide New Ways to Test Motorola Trunked Radio Systems (Options 3 and 8)

With the optional SmartNet™/SmartZone™ application, the 2975 provides innovative ways to test trunked radio systems including a new "scanner" mode that allows the user to follow a call from the control channel to the voice channel. This unique function allows for fast testing of system operation as well as RF performance tests. The

2975 also provides the ability to hand off to a P25 traffic channel directly from a SmartNet™ II Control Channel, allowing for interoperability testing in a repeater mode.

Full-Featured Communications Test System

For complete transmitter spectrum performance testing, swept antenna and transmission line testing and at-a-glance troubleshooting, the 2975 comes standard with a digitized 2.7 GHz spectrum analyzer and dual channel digital storage oscilloscope. In addition, the 2975 provides you with the functionality of over 20 discrete instruments integrated into a single platform. The 2975 provides as standard equipment all the tools you need to perform comprehensive RF testing.

- RF Receive/Generate with full cross band Duplex Operation
- AM/FM/C4FM Modulation and Demodulation
- RF Power/Frequency/Frequency Error/Distortion/SINAD/Voltage Meters
- Repeater simulation for Project 25 compliant radio testing in the conventional mode
- IF Filter settings match real-world application, with 12.5 kHz, 25 kHz, 60 kHz and 200 kHz selectable (FM)
- Extended post detection audio filters
- Full-feature store and recall functions
- New tone and tone remote signaling
- Spectrum Analyzer and Tracking Generator from 1 MHz to 2.7 GHz
- 500 kHz (Useable) Dual Channel Oscilloscope

High Tech Testing That's Easy To Use

Building advanced functionality into a test instrument means little if it's too complex to use efficiently. That's why we've focused on ensuring the 2975's advanced functions are easily harnessed. Exclusive control features include a standard communication service monitor look and feel with push key entry and soft-key functions for routine daily work. But added to this conventional operation is the power of today's technology including:

- Ethernet for remote control flexibility
- New internal web server for accessing files, status updates and remote display operation
- New E-Manual support allows you to upload test and alignment procedure for display directly on the 2975.
- PS2 keyboard and mouse operation
- Full GPIB and RS-232 interface with Remote Command Language
- On-board 20 GB hard drive to support future enhancements

New E-Manual Support

Now you have the ability to upload to the 2975 your own procedures for testing and aligning radio networks. This exclusive "E-Manual" operation allows you to eliminate the need for carrying additional manuals to the field - everything is self contained on the 2975!

Exclusive Spectrum Analyzer Features include new "Quick Tune" feature

Now, tuning the spectrum analyzer is as simple as a double click on the mouse. With Aeroflex's exclusive "Quick Tune" spectrum analyzer, the 2975 allows you to double click a signal on the spectrum analyzer screen and the analyzer will automatically change center frequency to the selected frequency.

Non-Proprietary Scripting Language

One of the 2975's most notable features is its use of the TCL/TK scripting language. TCL/TK is an open industry standard, with extensive third party support, which means that developing customized test routines is faster and easier. The 2975 also supports X Windows™ operation.

Supports Network Connectivity

Another key advancement is the use of modern network and connectivity technology. The 2975 employs Ethernet as one of its communication ports, thus allowing remote operation and data collection. You can also redirect display and keypad operations and software upgrades can be installed quickly over the Internet, saving you valuable time and virtually eliminating instrument downtime.

Man-Machine Interface

The high-resolution color display and alphanumeric keypad with multi-function soft keys provide a user-friendly interface. The menu structure has been enhanced to make complex test routines simple and straightforward. A 20 GB internal hard drive and 3.5 in. floppy drive simplify program installation and maximize flexibility in storage and recall of setup information, frequency lists and test data.

Portability

At 15 kg (33 lbs.), the 2975 is perfect for the field technician with a lot of ground to cover. Plus, its rugged design makes it an ideal solution for the rigors of the field.

SPECIFICATION

GENERATOR (RECEIVER TEST)

GENERATE PORT

Port Protection

10 W (+40 dBm) for 30 sec.

FREQUENCY

Range

1 MHz to 2.7 GHz

Resolution

1 Hz

Accuracy

Same as Time Base

OUTPUT LEVEL

GENERATE PORT

Range

+10 to -110 dBm

Resolution

0.1 dB

Accuracy

± 1.5 dB (<1.3 GHz), ± 2.5 dB (>1.3 GHz)

T/R PORT

Range

-30 to -137 dBm

Resolution

0.1 dB

Accuracy

± 1 dB <1.3 GHz >-120 dBm; ± 1.5 dB >1.3 GHz >-110 dBm

SPECTRAL PURITY

Harmonic Spurious

-25 dBc max >50 MHz

Non-Harmonic Spurious

-40 dBc max <1.5 GHz

-30 dBc max >1.5 GHz

Residual FM

<15 Hz rms (Post Detection BW = 300 Hz to 3 kHz)

SSB Phase Noise (20 kHz offset)

-100 dBc/Hz typical, -92 dBc/Hz max (<1 GHz), -90 dBc/Hz max (>1 GHz)

Residual AM

0.1% (Post Detection BW = 300 Hz to 3 kHz)

GENERATOR MODULATOR

FM

Deviation Accuracy

3%, +residual, \pm LSD (1 to 20 kHz deviation, 1 to 10 kHz rate)

5%, +residual, \pm LSD (>20 kHz deviation, 1 to 20 kHz rate)

Deviation Range

Off, 10 Hz to 40 kHz deviation

Deviation Resolution

10 Hz

Modulation Rate Bandwidth

50 Hz to 20 kHz (MOD 1, MOD 2 and Audio in [SINAD] unbalanced)

50 Hz to 20 kHz (Audio in [SINAD] balanced and Mic in)

Modulation Distortion (THD)

1% (1 kHz rate, 6 kHz deviation, 50 Hz to 20 kHz bandwidth)

External FM Sensitivity

Audio in 1

1 Vpp = 4 kHz deviation $\pm 15\%$ (50 Hz to 10 kHz unbalanced)

1 Vpp = 4 kHz deviation $\pm 15\%$ (50 Hz to 10 kHz balanced)

MIC input

1 Vpp = 40 kHz deviation $\pm 15\%$ (300 Hz to 3 kHz)

AM

AM Depth Range

30% to 90%

Resolution

1%

Rate

100 Hz to 3 kHz

Accuracy

$\pm 5\%$ (of full scale) + residual AM + resolution (1 kHz rate, RF Level

<-40 dBm T/R, <0 dBm Gen Port)

Distortion

4% Typical (30% to 90% modulation, 1 kHz rate, 0.3 to 3 kHz BW, RF

Level <-40 dBm T/R, <0 dBm Gen Port)

DIGITAL MODULATION FORMATS

C4FM at 9.6 kb/sec

FSK Error

<1% typical, <2% max

Project 25 Compliant Signals

1011 Hz tone

5% BER calibration tone

Speech (repeated test phrases)

Silence

Voice from audio inputs

RECEIVER (TRANSMITTER TEST)

FREQUENCY RANGE

1 MHz to 2.7 GHz

T/R PORT

VSWR - T/R Port

<1.2:1 to 1 GHz, <1.3:1 >1 to 2.7 GHz

Maximum Power

50 W continuous, 125 W 1 min/4 min off

Alarm

Alert sounds at 100°C pad temp or 135 W

ANTENNA PORT

Maximum Power

10 W (+40 dBm) for 30 sec.

Alarm

Switches to alarm on at 100 mW input (nominal)

FILTERS

IF Filters

12.5 kHz, 25 kHz, 60 kHz, 200 kHz (FM)

6 kHz (AM)

FREQUENCY COUNTER/FREQUENCY ERROR METER

Accuracy

Same as timebase \pm LSD

Resolution

1 Hz

FM DEVIATION METER

Meter Range

5 kHz, 10 kHz, 20 kHz, 50 kHz, 100 kHz, Auto

Resolution

10 Hz

Demod Output Sensitivity

1 Vpp = 5 kHz typical

Accuracy

\pm 5%, \pm 2 LSD +residual FM (12.5 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <5 kHz)

\pm 5%, \pm 2 LSD +residual FM (25 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <10 kHz)

\pm 5%, \pm 2 LSD +residual FM (60 kHz bandwidth, 1 kHz rate, deviation >1 kHz and <25 kHz)

\pm 7%, \pm 2 LSD +residual FM (200 kHz bandwidth, 50 to 20 kHz rate, deviation >5 kHz and <40 kHz)

AM MODULATION METER

Mod Depth

1% to 100%

Resolution

0.1%

Accuracy

\pm 5% of full scale +source residual AM

(6 kHz IF BW, 1 kHz tone, 10%-90% AM depth)

Modulation Rate

10 Hz to 3 kHz

Carrier Range

1 MHz to 2.7 GHz

RECEIVE SIGNAL STRENGTH LEVEL METER

Sensitivity

-70 to -20 dBm (no input attenuation selected)

Usable Input Range -80 to -10 dBm (no input attenuation selected)

Resolution

0.1 dB

Accuracy

\pm 1.5 dB

BROADBAND POWER METER FUNCTIONS (T/R PORT)

Accuracy

10% \pm LSD

Meter Range

100 mW to 200 W in 1,2,5 sequence

Dynamic Range

100 mW to 125 W

Resolution

3 digits

NARROWBAND POWER METER FUNCTIONS (T/R PORT)

Accuracy

\pm 1.5 dB (input level = +27 dBm); \pm 3 dB typical > +27 dBm

Meter Range

1 μ W (-30 dBm) to 200 W (+53 dBm)

Resolution

3 digits

RECEIVE AUDIO FREQUENCY COUNTER

Accuracy

Same as timebase \pm 1 Hz

Resolution

0.1 Hz/1 Hz

RECEIVE SINAD METER

Accuracy

\pm 1 dB \pm 1 LSD @ 1 kHz rate and 12 dB SINAD

Resolution

0.1 dB

Test Frequency

1 kHz

RECEIVE DISTORTION METER

Accuracy

\pm 1.5% \pm 1 LSD @ 1 kHz rate @ 5% distortion

Resolution

0.1%

Test Frequency

1 kHz

Meter Range

5%, 10%, 20%, 50%, 100% full scale ranges

DIGITAL DEMODULATION METERS

C4FM FSK ERROR

<2% + residual, 3% to 10% reading, 400 symbols

SPECTRUM ANALYZER FUNCTIONS

SWEEP (HORIZONTAL) ACCURACY

Frequency Range

1 MHz to 2.7 GHz

Frequency Resolution

1 Hz

Span Accuracy

±1% of (total) Span Width

Frequency Display

Span accuracy + Frequency standard accuracy + 50% of RBW

Sweep Rate Range

200 ms to 7 sec

Sweep Rate Accuracy

1%

HARMONIC SPURIOUS

-55 dBc @ -40 dBm (antenna port, no input attenuation)

NON- HARMONIC SPURIOUS

-60 dBc (10 MHz to 2.7 GHz) (antenna port, no input attenuation)

RESIDUAL SPURIOUS

-80 dBm (input terminated, antenna port, no input attenuation)

AMPLITUDE (VERTICAL)

Level Accuracy

±2 dB @ -30 dBm, input, -20 dBm Ref level (normalized) Antenna port, no input attenuation (typical)

Scales

2, 5 and 10 dB/div

LOG Linearity

±2 dB

Reference Level Resolution

0.1 dB

Attenuator Range

T/R 0 to 40 dB (10 dB steps, auto-coupled to reference level)

Ant 0 or 10 dB (auto-coupled to reference level)

Attenuator Accuracy

±0.5 dB/step, up to ±1 dB max (typical)

DYNAMIC RANGE

Antenna Port

<-100 (depends on RBW) to -20 dBm (no attenuation) ≤ -10 dBm with 10 dB attenuation)

T/R Port

<-30 to +30 dBm (no attenuation)

Typical Noise Floor Performance

-110 dBm, 10 MHz to 2.7 GHz (300 Hz resolution bandwidth)

Residual Phase Noise

-92 dBc/Hz @ 20 kHz offset

RESOLUTION BANDWIDTH

Analyzer Screen

300 Hz, 3 kHz, 30 kHz, 60 kHz, 300 kHz, 6 MHz

Generate and Receive Screens

300 Hz, 3 kHz, 60 kHz

Selectivity

60 dB/3 dB ratio <15:1

Bandwidth Switching Error

±1 dB

VIDEO BANDWIDTHS

None, 10 Hz to 3 MHz in 1-3-10 steps

SPECIAL FUNCTIONS

Display Modes

Live, Average, Peak, Compare, Tracking Generator, Coupled/Uncoupled(span/sweep time/RBW)

SPECTRUM ANALYZER VIDEO OUTPUT

Reference Level

= -5 V

Bottom-of-Screen

= +5 V

TRACKING GENERATOR

Frequency Range

10 to 2700 MHz

Output Level Range

Generator Port: +10 to -110 dBm

T/R Port: -30 to -137 dBm

Output Level Resolution

0.1 dB

Output Flatness

±2 dB ≤500 MHz span up to 1250 MHz center frequency

OSCILLOSCOPE FUNCTIONS

VERTICAL INPUTS

Input Channels

2 input channels (Ch1 and Ch2), MIC Input, Audio I/O Input, Internal Demodulation

Input Impedance

1 MΩ

External Coupling

AC, DC and GND

Range

20 mV to 50 V/div in a 1, 2, 5 sequence

Accuracy

10% of full scale (DC to 50 kHz, source impedance <100)

Bandwidth

500 kHz usable

HORIZONTAL SWEEP

Range

10 μ s/div to 1 sec/div

Accuracy

1% of full scale

TRIGGER SOURCE

Channel 1, Channel 2, Internal or External Trigger

External Trigger: expects a TTL level (2 V-trigger level)

SPECIAL FUNCTIONS (Markers, Delay, etc.)

Modes: Live, Triggered Mode (Auto, Normal, Single shot trigger, persistence)

SMARTNET™ /SMARTZONE™ TRUNKING

Signaling Types

SmartNet™, SmartZone™ (Type II)

Call Tests

Analog and P25 (Digital Traffic Channel) Mobile Initiated tests and System Initiated tests

Testing Results

Power, frequency error, RSSI, deviation, sensitivity, SINAD, audio counter, C4FM EVM, distortion

Protocol Trunking Message Elements

Analog: System ID, Group ID (Automatically determined upon PPT), Unit ID (Automatically determined upon PTT), Frequency Band, Control Channel, Traffic Channel (by frequency and channel number) Digital (P25 Traffic Channel): System ID, Group ID (Automatically determined upon PPT), Unit ID (Automatically determined on PPT), NAC and MFID (Automatically detected upon PPT), Frequency Band, Control Channel, Traffic Channel by Frequency and Channel Number

Frequency Bands

851 - 870 MHz, 866 - 870 MHz Split Channel,

403 - 522 MHz UHF, 132 - 175 MHz VHF, User defined

Channel Plan Entry for VHF/UHF

Separate transmitter and receiver start-and-end frequency for threeblocks. Independent channel spacing for each block.

Special Features

SmartNet™/SmartZone™ trunking channel assignment to P25 traffic channel

Control Channel Scanner

Search and find control channel within the channels bands. Search by channel number with automatic verification and display of found control channels. Found control channels also display System ID information automatically. Upon selection of live control channel, the 2975 will track control channel, group ID or unit ID traffic.

LTR TRUNKING OPTION

Modes

Repeater Simulator, Mobile Simulator

Testing Results

Power, Frequency Error, RSSI, Deviation, SINAD, Audio Counter, Distortion

Protocol Trunking Message Elements

RIC, Home Channel, GOTO Channel, Group, Free Channel, Area, Border Bit, Received Data analysis in both repeater and radio simulation modes

Call Modes

Repeater Simulator: Idle, System Busy, Repeater Busy, Continuous Disconnect Radio Simulator: Idle, PTT Inverted Operation supported in both simulation modes

Configuration Bands

User, 800 MHz, 900 Mhz

User Configurable RF parameters

Deviation

AUDIO FREQUENCY GENERATOR

WAVE SHAPE FORMATS

Wave Shapes

Sine, Square, Triangle, Ramp

AMPLITUDE

LEVEL

(FGEN 1 and 2 combined cannot exceed the following port limitations.)

Unbalanced

0 to 20 Vpp into 10 k .(Audio Out 1 [FGEN] and Audio Out 2 [DEMODO])

Balanced

High Range: 0 to 6 Vrms into 10 k . (Audio Out 1 [FGEN] only)

Low Range: 0 to 600 mVrms into 10 k . (Audio Out 1 [FGEN] only)

RESOLUTION

High Range

1 mV (Audio Out 1 [FGEN] and Audio Out 2 [DEMODO])

Low Range

0.10 mV (Audio Out 1 [FGEN] only)

ACCURACY (SINEWAVE)

Unbalanced (Audio 1 or 2, level >0.5 Vpp)

3% (20 Hz to 3 kHz)

Balanced

High Range: 10% (frequency at 1 kHz, level >0.5 Vpp)

Low Range: 10% (frequency at 1 kHz, level >0.05 Vpp)

Distortion (THD, Sinewave)

<0.5% (1 kHz, 3 Vpp)

<2% (20 Hz to 20 kHz, 1 through 15 Vpp)

FREQUENCY

RANGE

Unbalanced

DC to 20 kHz (Audio Out 1 [FGEN] and Audio Out 2 [DEMOD])

Balanced

50 Hz to 20 kHz (Audio Out 1 [FGEN] only)

Resolution

0.1 Hz

Accuracy

±1 Hz

TONE SIGNALING

DTMF, DCS, CTCSS, 5/6 Tone, Tone Remote

FILTERS

High Pass

300 Hz, 4 kHz

Low Pass

300 Hz, 4 Bessel kHz, 15 kHz, 20 kHz, 4 kHz LP Butterworth

Band Pass

300 Hz to 4 kHz

80Hz and 3kHz Narrow

APCO-25

SINAD

C-Weighted

BASE-BAND AUDIO FUNCTIONS

INPUT LEVEL RANGE

Audio In

200 mVpp to 20 Vpp

MIC In

10 mVpp to 1 Vpp

FREQUENCY RANGE

Unbalanced (10 k .Nominal)

Audio IN (SINAD) input - 50 Hz to 20 kHz

Balanced (600 .Nominal)

Audio IN (SINAD) input - 50 Hz to 20 kHz

Mic (MIC) Input (10 k .Nominal)

50 Hz to 20 kHz (unbalanced)

AUDIO FREQUENCY COUNTER (DEMOD SELECTED)

Input Sources

Demodulated Audio, MIC Input, Audio (SINAD) Input

Ranges

200, 500, 1 k, 2 k, 5 k, 10 k, 20 k

Accuracy

±1 Hz

Resolution

0.1 Hz

MICROPHONE AUDIO INPUT

Modes

Electret: +5 V through 5 k Nominal

Dynamic

DVM FUNCTIONS

AC

Input Impedance

1 M Ω , 600 Ω , 150 Ω

Range

400 mV to 100 V in a 1, 2, 4 sequence

Resolution

0.1 mV (0.4 V scale), 1.0 mV (1, 2, 4 V scales), 10 mV (10, 20, 40 V scales), 100 mV (100 V scale)

Accuracy

6% of full scale (50 Hz to 20 kHz) ±1 LSB

DC

Range

400 mV to 100 V in a 1, 2, 4 sequence

Resolution

Same as AC

Accuracy

2% of full scale ±1 LSB

Input Impedance

10 M Ω Nominal

TIME BASE

Output Frequency

10 MHz

Time Base

±0.01 ppm stability; ±0.1 ppm/year aging

Output Level

1 to 5 Vpp into 10 k Ω

Warm-up

<5 minutes

DIGITAL I/O

Parallel Printer Port; Video Monitor Port (VGA); Mouse Port (PS2 compatible); Keyboard Port; Front Panel Test Port; 3.5 in. Floppy Drive

REMOTE COMMAND INTERFACE

RS-232, IEEE-488 (GPIB) or TCP/IP (Ethernet) Remote Control Interface

For more specialized testing, the IFR 2975 can be programmed through the industry standard language TCL.

DISPLAY

Resolution

VGA

Height

99 mm, 3.9 in.

Width

131 mm, 5.15 in.

AC LINE

Power Requirements

100 to 120 VAC at 60 Hz

Max. Power 200 W at 120 VAC

220 to 240 VAC at 50 Hz

ENVIRONMENTAL/MECHANICAL

Weight

15 kg (33 lbs.)

Dimensions

356 mm wide, 197 mm high, 520 mm deep

14 in. wide, 7.75 in. high, 20.5 in. deep

Operating Temp Range

0° to 40°C

Storage Temp Range

-25° to 70°C

WARRANTY

2 years

Extended warranty available upon request

VERSIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers

Versions

2975 Project 25 Radio Test Set

For the latest version of 2975 software please visit www.p25.com.

Options.cpm

2975OPT3	SmartNet™/SmartZone™ VHF/UHF and 800 MHz
2975OPT4	P25 Trunking 800 MHz
2975OPT6	Control Channel Logger (Requires 2975OPT4 or 2975OPT14)
2975OPT8	SmartNet/SmartZone 900 MHz (Req's 2975OPT3)
2975OPT9	Autotest 1
2975OPT10	AES (Export Restricted)
2975OPT11	LSM/P25 Phase 2
2975OPT12	KVL Keyloader
2975OPT13	LSM Advanced/P25-2 Advanced (Requires 2975OPT11)
2975OPT14	P25 Trunking VHF/UHF/700 MHz
2975OPT15	Audio Analyzer Option
2975OPT16	Analog Simulcast Align Option
2975OPT17	RX BER Option
2975OPT18	LTR™ Trunking Option

Accessories

AC25008PP	2975 Operation Manual - Paper (Supplied as standard)
AC25008CD	2975 Operation Manual - CD-ROM (Supplied as standard)
AC25007	Microphone\Audio Adapter
AC25009PP	Maintenance Manual/No Software
AC25011	Case, Transit W/Wheels
AC25012	Case, Soft Padded Carrying
AC25013	KIT, 10/20 db Pads, TNC
AC25014	Scope Probe Kit
AC25015	UHF Antenna (Supplied as standard)
AC25022	Front/Rear Cover
AC25025	RF Connector Kit
AC25026	RF Cable
AC25027	TNC to BNC Adapter
AC25029	Accessory Pouch
AC25100	FAA Kit (Includes AC25007, AC25012, AC25023, AC25027, AC25029)
AC4105	Return Loss Bridge (1.3 GHz)
CALFB2975	Calibration Certificate
W2975/203	Warranty Extension one year (total warranty three years)
W2975/204	Warranty Extension two years (total warranty four years)

W2975/205 Warranty Extension three years (total warranty five years)

For more product related information visit www.p25.com.

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